

elongated lips of chitin, while the pits proper are more round in shape. The naked tips of the sensory spine cells are seen in cross sections in great numbers. While these pits are regarded as olfactory, it may well be that the olfactory sense is not confined to the pit spines alone, but is only more sensitive here because of the thinness of the chitin. It may occur in some degree over the exterior.

On many Lepidoptera the males have these external sensory scales so well developed that they are enabled to pick up the trail of a female of their species by the scent she leaves in passing through the air. In such cases the antennæ are largely developed, while the shoulders and fore limbs also are covered with a special growth of scales which seem actively to function as olfactory organs.

A moth called *Chyfolisa morbidalis* has in the male a brush of enormous scales on each front leg, which exceeds the entire combined size of the head and antennæ. In this case the whole front of the body becomes a quivering agency of sex determination.

It seems reasonable that this is a case of animal tropism, the pathway of chemical particles left in the air by the female acting on the sensitive spines much as light acts on the eyes.

It is possible that this chemical sensitiveness to particles in the air is partly responsible for the irregular flight of such animals.

### 3. VAGINICOLA; AN INTERESTING PROTOZOAN

The form described herein is apparently related to the Vorticellidæ, a family of infusorians remarkable for beauty and variety. From their shape these animals are often called Bell-animalcules. They are attached, either temporarily or permanently, and often have a distinct stalk.

They are usually marked histologically by a long ribbon-shaped nucleus, a circle of vibratile cilia around the oral end, and by a lengthwise binary division as one of the methods of its multiplication.

The form described here was found June, 1912, in collections from Goghuac Lake, near Battle Creek. It is free, has a capsule, seemingly of a chitinous or horny nature possessed of an oval aperture. In all the specimens studied there is a pair of individuals in each capsule.

Figures 1 and 2, Plate XII., are photographs of longitudinal and cross-sectional views, respectively, of the animal. Figures 3 and 4, Plate XII., are diagrams simplifying and interpreting the former figures. From these the main details of the anatomy can be made out.

The twin individuals arise apparently by binary division of the parent. Further multiplication is by motile gametes, which bud from the adult. These arise in a string and suggest ova in higher animals.

The oval cilia are not in a wreath form, but line the gullet into which they are retracted when not in use.

The body wall contains fibrils similar to those found in the Vorticellidæ.

#### 4. PROCYTOS VULGARIS; AN INORGANIC CELL

There is a question which often comes into the mind of students of cytology: "Where does the cell form come from? What was its origin and what relation does it bear to organic and inorganic nature?"

There is a growing number of students of natural phenomena who are diligently striving to show the relations of the organic world to the inorganic. To such the following study may be of interest.

A look at the photo (Plate XII., Fig. 5), which I have called *Procytos vulgaris*, shows a cell structure which bears a striking resemblance to many animal and plant tissues.

Here are to be found wholly inorganic formations which suggest cells with cell walls, nuclei, nucleoli, filaments and cytoplasm bodies. These structures are purely inorganic and can be produced in the liquid form of any material, by observing certain conditions of temperature.

The material used in the present experiment is ozokerite, a refuse product from oil refineries in the form of wax. If this is melted and poured on a hot plate and allowed to cool slowly we get the effect pictured above.

The Giant's Causeway in Ireland is a somewhat similar production on a large scale, in an ancient outpour of lava or melted rock.